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TARGET PAPER 2023 PHYSICS XII

Chapter 11:

- 1. Write down the two statements of second law of thermodynamics and prove their equivalence.
- 2. What is Carnot Engine? Describe its construction, working, and derive an expression for its efficiency
- 3. Write the postulates of kinetic molecular theory of gages and show that average translation Kinetic Energy per molecule is directly proportional to the absolute temperature.
- 4. State the First Law of thermodynamics and explain on its basis: (a)isobaric process (b)Isothermal process (c) adiabatic process and (d) isochoric process.
- 5. Derive the Cp-Cv=R, symbols have their usual meanings.

Problems: 11.3, 11.4, 11.6, 11.9 & 11.11

Chapter 12:

- 1. What is compound capacitor? Derive an expression for its capacitance, if the space between the plates is partially filled with a slab of dielectric.
- 2. Define capacitance. Derive an expression for the capacitance of a parallel plate capacitor when space between the plates is:
 - (i) filled with a dielectric.
 - (ii) Free space between plates.
- 3. Derive the relation between the electric intensity and electric potential?
- 4. Prove that 1Volt/ Meter = 1Newton / Coulomb, name the physical quantity which has these units? Problems: 12.1, 12.6, 12.8, 12.10, 12.11, 12.15, 12.17 & 12.19

Chapter 13:

- 1. State the law governs the potential difference across the conductor and the current passing through it How the resistances of a conductor related to its dimensions?
- 2. Differentiate between terminal potential difference and EMF of a battery. Derive the relevant expression?
- 3. Derive the equivalent resistance when resistors are connected in series and parallel.

Examples: 13.5, 13.6, 13.8 & 13.10

Problems: 13.5, 13.10, 13.11, 13.12, 13.16, 13.17, 13.18, 13.19 & 13.21.

Chapter 14:

- 1. State Faraday's Law of Electromagnetic Induction. Explain the phenomenon of mutual or self-Induction.
- 2. Derive the relation for force on a current carrying conductor in a uniform magnetic field?
- 3. Determine the method for determining the charge to mass ratio of an electron. Derive the mathematical relation.
- Draw the labeled diagram of an AC generator and derive the expression for alternating voltage produced.
- 5. Define and derive the expression of motional emf.

Problems: 14.1, 14.6, 14.7, 14.8, 14.10, 14.11, 14.12, 14.13, 14.14 & 14.15.

Chapter 15:

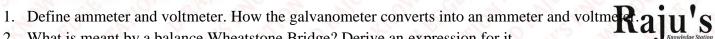


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2. What is meant by a balance Wheatstone Bridge? Derive an expression for it.

Problems: 15.2, 15.3, 15.5 & 15.7

Chapter 16:

- 1. What is a semiconductor diode? Differentiate b/w intrinsic & extrinsic semi-conductor.
- 2. What is PN junction? Explain the formation of potential barrier in PN junction?
- 3. Describe the working of NPN or PNP transistor.

Chapter 17:

- 1. Explain the Pair Production briefly?
- 2. State the basic postulates of the Special Theory of Relativity and write it consequences.
- 3. What is Photoelectric Effect? With the help of graph discuss some of the important results of this theory. Derive Einstein's photoelectric equation.

Examples: 17.7, 17.8, 17.9, 17.11, 17.12 & 17.13

Problems: 17.3, 17.4, 17.10, 17.12 & 17.15.

Chapter 18:

- 1. Derive the expression of the wavelength of photons emitted in hydrogen spectrum and write the different spectral series.
- 2. State Bohr's postulates for hydrogen atom. Applying Bohr's postulates on hydrogen atom and derive an expression for the radius of the nth orbit.
- 3. Describe the construction and working of ruby laser.

Examples: 18.3 & 18.4 Problems: 18.2, 18.3, 18.4 & 18.5

Chapter 19:

- 1. What is Nuclear Fission? Discuss Fission Chain reaction. How the chain reaction control and which device is used, explain?
- 2. Write the equations showing the change in the parent nuclei by α , β and γ decay?
- 3. State and explain the law of radioactive decay with its exponential curve and derive half-life.

Problems: 19.4 & 19.6 Examples: 19.4 & 19.6

Chapter 20:

Describe the construction & working of Geiger counter with the help of diagram.



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